

American River Basin: Antelope Creek Improvement Project

Attachment 6: Monitoring, Assessment and Performance Measures

Overview

Presented in this attachment are draft monitoring, assessment and performance measures for the Antelope Creek Improvement Project, one of three projects that comprise the American River Basin (ARB) Integrated Regional Water Management (IRWM) Proposition (Prop) 1E Stormwater Flood Management Grant set of proposals. The Project Performance Measures table included herein presents the following project-specific information:

- Project goals
- Desired outcomes
- Output indicators – measures to effectively track output
- Outcome indicators – measures to evaluate change that is a direct result of the work
- Measurement tools and methods
- Measurable targets that are feasible to meet during the life of the Proposal

The Project Performance Measures presented below will be used to develop a Project Performance Monitoring Plan that includes monitoring criteria and an implementation schedule for the Antelope Creek Improvement Project. This plan will be established and administered to assess and evaluate the project's performance and as a tool for reporting on its implementation. The cost for preparing the Project Performance Monitoring Plan is included in each project budget, in Budget Category (g) Other Costs. The implementation of the Project Performance Monitoring Plan will be conducted under Budget Category (e) Environmental Compliance/Mitigation/Enhancement.

In compliance with the four Groundwater Management Plans for the region, the ARB IRWMP participants have an extensive groundwater monitoring network for monitoring water elevation and quality, and to a lesser extent, land subsidence. These monitoring activities help the ARB region maintain the quantity and quality of the groundwater through meeting pre-determined Basin Management Objectives (BMOs). Any groundwater data collected as part of this project will be incorporated into the data collection and analysis currently underway. Additionally, at the State level, data will be disseminated to the Surface Water Ambient Monitoring Program (SWAMP) and the new California Statewide Groundwater Elevation Monitoring (CASGEM) Program, as applicable. Data also will be disseminated to California Department of Water Resources (DWR) for inclusion in its databases such as the Water Data Library, which contains groundwater level and water quality data.

Project Summary

The Antelope Creek Improvement Project is a collaboration between Placer County Water Agency (PCWA) and Placer County Flood Control and Water Conservation District (District). This multi-objective regional flood control, water supply and water quality improvement project is located within the Dry Creek Watershed area of the American River Basin and will be completed in three phases. The project will meet multiple planning objectives by improving water supply and water quality, increasing flood protection, restoring local ecosystems and expanding an existing public recreation corridor.

Phases 1 and 2 of this multi-purpose effort include a regional flood control project on Antelope Creek, a major tributary of the larger Dry Creek. Through the design and construction of two on-channel weirs along an existing open space-protected reach of the creek, the project will provide flood control and flood damage reduction benefits to repeatedly damaged areas of downtown Roseville. The project will reduce peak flood flows over a wide range of flood events, improve the timing of flood flows, enhance existing riparian corridor ecosystems, and improve water quality through groundwater recharge and the natural treatment of temporarily-stored flood waters within the floodplain. Both ecosystem restoration and public recreational opportunities will be enhanced wherever possible within the floodplain of Antelope Creek, which currently includes a multi-purpose public trail system. In-stream improvements will include bank re-contouring to ensure overbank flows, specific habitat enhancements for fisheries, removal of invasive plant species and replanting with natives. An interpretive trail sign system and a public trailhead / community node are also proposed to improve access to the multi-purpose trail system while helping to educate the public on the project.

The Antelope Creek Improvement Project also includes improvements to the upstream Clover Valley Reservoir (to occur during Phase 3), which regulates water deliveries in the lower Antelope Canal and Creek and is operated by PCWA. The unlined portion of the Antelope Canal, near the Union Pacific Railroad track crossing, feeds the reservoir and has experienced severe erosion and down-cutting causing the reservoir to become silted and impairing the reservoir capacity. This phase of the project will construct a pipeline to convey the water from the Antelope Canal to the reservoir to reduce or eliminate erosion, and will include dredging of the reservoir to remove existing sediment and silt, restoring reservoir capacity and improving water quality both in the Reservoir and in the downstream Clover Valley Creek and Antelope Creek.

Aside from the individual benefits of each phase of the project, the overall Antelope Creek Improvement Project will provide flood reduction, water supply, and water quality benefits to the region. The desilting of the Reservoir in Phase 3 of the project, along with the two weirs from the first two project phases, will allow for better flood management of Clover Valley and Antelope Creeks and for the overall Dry Creek Watershed. Additionally, the third phase of the project will reduce the long-term operational costs of the first two phases by possibly reducing the sediment load in Antelope Creek by reducing the frequency of weir maintenance activities.

Project Performance Measures Table

A Project Performance Measures table has been created for the Antelope Creek Improvement Project to indicate the project goals, desired outcomes, output indicators, outcome indicators, measurement tools and methods and targets (Table 1). This table will be updated prior to project implementation and will be used to assess and evaluate the implementation and performance of the project, and as a means of reporting on the projects achievements relative to its overall goals.

Some of the monitoring measures that will be conducted as part of the project performance monitoring program include reviewing ALERT stage gage recordings to compare pre- and post-implementation data, spot checking the site to count the number of visitors, and comparing water sampling collections, lab analyses and field turbidity tests before and after project implementation. These measures will help evaluate the output indicators and outcome indicators to ultimately determine to what extent the project is meeting its goals and desired outcomes.

Table 1: Antelope Creek Improvement Project Performance Measures Table

Project Goals	<ul style="list-style-type: none"> - Provide regional flood control benefits to critically impacted areas of Roseville and unincorporated Placer County - Improve an existing recreational corridor - Improve water quality in Clover Valley Reservoir, Clover Valley Creek and Antelope Creek - Reduce sedimentation in Clover Valley Reservoir and in the downstream reaches of Clover Valley Creek and Antelope Creek - Restore riparian corridor and floodplain habitat - Improve public education - Create recreational opportunities for the community - Increase PCWA's water system operational stability
Desired Outcomes	<ul style="list-style-type: none"> - Provide peak flood flow reduction within the Dry Creek Watershed - Reduce sediment loading into Antelope Creek and Clover Valley Creek and Reservoir - Restore native vegetation to creek corridor and improve habitat for special status species - Increase groundwater recharge capacity in the stream system - Provide improved public access and educational opportunities along recreational corridor
Output Indicators	<ul style="list-style-type: none"> - Readings/data recorded of creek stage from stream level gages and/or weirs - Reservoir, canal, and creek water quality sample analyses - Field inspection records for native vegetation establishment - Visitor counts
Outcome Indicators	<ul style="list-style-type: none"> - Change in peak flows (cfs) or creek stage (feet) during flood events - Quantity of total suspended solids (TSS) in water samples - Percent of native vegetation coverage in creek corridor - Number of visitors using the trails
Measurement Tools and Methods	<p>Tool - ALERT stage gage recordings</p> <p>Method - data collected automatically during flood events; comparison of pre- and post-construction data to demonstrate peak flow reduction</p> <p>Tool - Water Quality Testing</p> <p>Method - comparison of water sample collection and laboratory analyses before and after project completion</p>

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Measurement Tools and Methods (continued)	<p>Tool - HACH Turbidity meter Method - Field turbidity tests of the water to determine effectiveness sediment removal; comparison of pre- and post-construction data to demonstrate turbidity reduction</p> <p>Tool - count number of visitors to the site Method - periodically spot check the site to determine the number of visitors and compare to pre-project visitor counts</p> <p>Tool - Mitigation monitoring of vegetation Method - Annual mitigation report of vegetation establishment</p>
Targets	<ul style="list-style-type: none"> - Up to 1,000 cfs peak flow reduction in 100-year event in downtown Roseville - 5% reduction in average TSS concentrations as measured in water at baseline levels - 80% successful establishment of new native vegetation - Reduction in turbidity levels downstream of Clover Valley Reservoir - Increase number of visitors to the site to 210 visitors per day